

Interactions of Brown Bears, *Ursus arctos*, and Gray Wolves, *Canis lupus*, at Katmai National Park and Preserve, Alaska

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We describe several encounters between Brown Bears (*Ursus arctos*) and Gray Wolves (*Canis lupus*) that were observed at Katmai National Park and Preserve in southwest Alaska. Katmai Brown Bears and Gray Wolves were observed interacting in a variety of behavioral modes that ranged from agonistic to tolerant. These observations provide additional insight regarding the behavioral plasticity associated with bear-wolf interactions.

Key Words: Brown Bear, *Ursus arctos*, Gray Wolf, *Canis lupus*, interactions, Katmai National Park and Preserve, Alaska.

Flexibility in mammalian behavior parallels the evolution of large brains (Gilbert 1989). Gittleman (1986) presented data showing that bears and wolves have the highest brain:body weight ratios within the order Carnivora, and claimed that this accounts for their behavioral plasticity. The context of the encounter setting, as well as the behavior of individual animals, likely influences the resulting relationship between bears and wolves at any given time.

Alaska Brown [Grizzly] Bears (*Ursus arctos*) and Gray Wolves (*Canis lupus*) are sympatric over much of their range and often compete for access to the same food resources (Adams et al. 1995). As sympatric, apical predators, bears and wolves probably interact frequently, although reports in the scientific literature are scant. The accounts reported illustrate the variable nature of Brown Bear – Gray Wolf interactions, and range from mutual tolerance (Lent 1964), to competitive (Adams et al. 1995; Hornbeck and Horejsi 1986; Ballard 1982), to predatory (Ballard 1980; Hayes and Mossop 1987). This note describes additional Brown Bear – Gray Wolf interactions observed at Katmai National Park and Preserve on the Alaska Peninsula, approximately 400 km southwest of Anchorage, Alaska.

Wolves harass bears

On 24 June 2001, while conducting Brown Bear research at Hallo Bay (154° 05' W, 58° 27' N) on the Katmai coast, the authors observed a pack of five wolves harass a pair of courting Brown Bears on the edge of extensive salt marsh meadows (*Carex* spp., *Plantago* spp., *Triglochin* spp.). Prior to this observation, we had repeatedly heard wolves “chorus howling” (Harrington and Asa 2003), and noted that the pack was gradually nearing our research field camp situated on the far end of the meadow. Anticipating their arrival, we positioned ourselves where we could observe them when they entered the meadow. Although

it was late in the evening (2230 h Alaska Daylight Time), it was still light enough to see so we patiently waited while scanning the meadow. About 400 m south of our position, a pair of Brown Bears foraged on sedges in the meadow near a willow-alder (*Salix* spp., *Alnus* spp.) thicket. After we waited 10 minutes, the wolf pack suddenly appeared, emerging from the dense thicket about 25 m north of the two bears. The wolves trotted single file in the direction of the bears. Three of the five wolves had black-gray coats, similar in pattern to that of the German Shepherd (*C. domesticus*) breed of domestic dog; one wolf's coat was pure white; the other coal black. All five wolves appeared to be mature adults, standing nearly 1 m at the shoulder and similar in stature.

As one, the wolves circled south from the meadow's center toward the bears, which by then were focused on the wolves. The five wolves lined up, head-to-head, with the large male Brown Bear with < 2 m separating the lead wolf and the bear. Suddenly, one wolf rushed the male bear, which in turn lunged and swatted at the attacking wolf with its foreleg. Leaping forward, ducking the bear's defensive swat, then breaking away, the wolves took turns harassing the male bear. The bear responded to the attack with short lunges and aggressive paw swats while slowly backing away. About a minute into the confrontation, two wolves circled the bear and lunge-nipped at his unprotected hindquarters. In defense, the male bear swiftly spun around and swatted at the closest attacker, but the wolf dodged the bear's swinging paw then trotted a few meters away, tail wagging high. While the male bear counter-attacked the wolves formerly at his rear, the other three wolves, now at his unprotected hindquarters also began a nipping attack, to which the bear again whirled around, lunged, growled, and aggressively swatted at the wolves. The wolves easily outmaneuvered the large bear's paw swipes and lunges with quick, evasive maneuvers.

The wolves and male bear repeated this attack-counter attack interaction several times before a group of three wolves split from the pack and rushed the female bear that had been watching from a distance of about 10 meters, near the edge of the thicket. Repeating the same lunge, nip, and run strategy, the two groups of wolves attacked each bear, which rapidly spun around to defend themselves from the lunging-biting wolves. At this point, approximately 10-20 meters separated the two bears as they fended off the wolves. During these aggressive interactions, neither wolves nor bears were observed making physical contact, although the confrontation appeared quite serious. After 5 minutes of sustained confrontation, two wolves abruptly terminated their attack and began chasing each other in tight circles a short distance from the other wolves, wagging tails held high. Moments later, the remaining three wolves also withdrew, excitedly darted about, wagging tails, and then joined the others. After regrouping about 30 m from the bears, all wolves participated in a series of long, drawn-out "chorus" howls. From the forest to the west, responding howls (possibly from a single wolf) were heard in apparent reply. Moments later, the pack trotted southward into the rapidly dimming twilight, away from the bears and researchers. The entire interaction took approximately 20 minutes from the time the wolves were observed entering the meadow to when they disappeared into the dusk.

To the best of our knowledge, there had been no food source from which the wolves were attempting to drive the bears. It appeared to us that this wolf pack had encountered and approached these two bears and attempted to test, or harass, them for a short period before breaking off the encounter and moving on.

Wolves steal fish from bears

In mid-July 2001, a pair of Gray Wolves was observed stealing Chum Salmon (*Oncorhynchus keta*) from Brown Bears at Middle Creek where it empties into Hallo Bay on the Katmai coast. National Park Service (NPS) ranger Stephens Harper first saw the wolves when they trotted past the rangers' camp at 0830 h, heading to the nearby beach. Bears and wolves frequent the tidal flats because the stream channel is quite shallow at low tide, thus making salmon more vulnerable to predation. Harper walked to the stream mouth a few minutes before noon and observed two wolves and five single adult bears fishing in close proximity to one another.

Both wolves were gray with black highlights; one appeared mature, while the other was younger, lankier, and smaller (Figure 1). Fishing at the river mouth were five adult single bears. The younger wolf bedded on a gravel bar some distance from the bears while the other, much closer, visually scanned them, apparently waiting for one to catch a fish successfully. Once a bear caught a fish, the older wolf would move in, head low, and attempt to steal it by suddenly lunging and snagging a portion away from the bear. In

response, the bear would protect its quarry by bolting and running after the wolf. Although there was a lot of chasing up and down the stream banks, the wolf easily outran and outmaneuvered these bears. This strategy worked, however, in getting bears to abandon what was left of the fish and the wolf would circle back around and eat these scraps. In turn, the older wolf would trot over to where the other was bedded, regurgitate a portion, and then head back to where the bears were fishing. During the entire hour that Harper watched, the wolf determinedly attempted to snatch fish from bears. Although these wolves attempted to catch salmon for themselves on several occasions, they were unsuccessful. One wolf, however, scavenged a Starry Flounder (*Platichthys stellatus*) lying on the beach that had been exposed at low tide.

Wolf displaces a bear from a moose carcass

In June 1997, an NPS employee observed a single wolf feeding on a Moose (*Alces alces*) carcass near a gravel pit adjacent to the Valley of Ten Thousand Smokes Road, approximately 13 km from Brooks Camp. Adjacent to the gravel pit is a wetland-pond complex impounded by a Beaver (*Castor canadensis*) dam. The following day, NPS employees Jim Gavin and Tom Ferguson observed a wolf and bear simultaneously at the site. The wolf was gray with black highlights, appeared mature, but thin. The bear was a young female, approximately 4 years of age. Initially, only the bear fed on the carcass while the bedded wolf watched from 40 m distant. After a while, the wolf moved in close and began harassing the bear by charging and biting at its hind legs. The wolf's constant attacks disrupted the bear's feeding as it defended itself. After 1.5 min of intense harassment, the bear took flight into the forest and the wolf usurped the carcass and started feeding. After approximately 10 min of feeding, the satiated wolf trotted off into the forest, reappeared 20 min later, then repeated the process several times, likely caching food (L. Adams, USGS research biologist, personal communication), or transporting it to young at a den nearby. Gavin observed the wolf feed in this manner for three consecutive days. On the third day, while the wolf was absent, the bear returned and resumed control of the Moose carcass. The wolf reappeared but did not approach any closer than 40 m to the feeding bear. Gavin did not observe the wolf attempt to displace the bear as before, although his observation sessions were only 30 min daily.

Bears and wolves fishing together

Chum Salmon enter freshwater to spawn in Hallo Bay's Middle Creek from early July through August. In 2001, Brown Bears and wolves were repeatedly observed fishing side-by-side (approximately 5 m apart) at this location with no apparent interactions or obvious concern toward the other species. Like bears, wolves sat patiently on the gravel bank and scanned the water

for incoming salmon. Upon catching sight of an incoming salmon, both bears and wolves would leap into the stream and attempt to capture it. Both bears and wolves appeared indifferent to one another, completely focused on fishing.

Similarly, in August 1992, NPS rangers B. Holmes and S. Klenzendorf observed a lone wolf and several bears fishing in close association for 2 h at Margo Creek (155° 03' W, 58° 29' N) in the western portion of Katmai National Park. At 1210 h on 13 August, an old female Brown Bear was fishing when a wolf appeared suddenly on the riverbank, watched the bear, and then sat down. The wolf was moderate in size and of gray coloration. The wolf wandered in the direction of the bear, entered the creek and retrieved a spawning Red Salmon (*Oncorhynchus nerka*). As the wolf fed, the bear wandered downstream towards the wolf. Consequently, the wolf abandoned its catch, moved quickly away, picked up another salmon, and then moved into the nearby White Spruce (*Picea glauca*) forest. At 1245 h, the wolf reappeared from the forest, plunged into the creek and emerged with a live salmon. Carrying the salmon in its mouth, the wolf disappeared again into the heavy cover of the forest. At 1255 h, the wolf reappeared and entered the creek in search of salmon. As the wolf waded about searching for fish, the same bear waded downstream until she and the wolf were about 20 m apart. In apparent response, the wolf abruptly ceased fishing, climbed out of the river and sat and watched the bear as it sought fish in that section of stream. Twenty minutes later, the wolf moved upstream and caught a salmon. As the wolf fed, a large adult male bear suddenly appeared thus causing the wolf to leave the area. The large male bear quickly caught a fish, then left the river, at which time the wolf reappeared. Moments later, the wolf caught a fish then reentered the forest. The observers left at 1402 h, impressed with the degree of tolerance the two species appeared to have for one another.

Wolf and bears traveling together

In June 1989, Aleska Szweda, an NPS employee stationed at Brooks Camp (155° 05' W, 58°33' N) in the western portion of Katmai National Park, observed a lone wolf traveling in the company of two Brown Bears. Szweda was driving along the park road, approximately 8 km from Brooks Camp, when she noticed what appeared to be two bears in the middle of the roadway, approximately 400 m ahead. The lumbering vehicle's approach prompted the bears to abandon the roadway suddenly, exposing a wolf that had apparently been in their immediate company (<2 m). The wolf too left the road, following the bears into the forest.

The following day, five park visitors reported seeing two bears and a wolf cross the Brooks River at a location known locally as the Oxbow. It was generally believed that these were the same three observed by Szweda the day previous along the park road, 8 km



FIGURE 1. Gray Wolf at Hallo Bay, Katmai National Park and Preserve, Alaska (Kent Fredriksson photograph).

distant. The bears and wolf were clearly traveling as a group as they worked their way down the riverbank, probed the riverbed for the shallowest crossing, and then emerged on the other side. It was reported that the trio fed together in an unusual manner; when the bears caught fish they fed only upon the brains and skin, leaving the rest for the wolf which, sitting immediately adjacent, would spring forward, snatch and eat the remainder. It is not unusual to see Red Foxes (*Vulpes vulpes*) or gulls (*Larus* spp.) attempting to snatch fish scraps from Brown Bears on salmon streams. But bears in these instances are far from cooperative, often lunging at the would-be thief, catching and killing them on occasion (T. Smith, personal observation). However, in this case, the bears tolerated the wolf's presence and, according to observers, did nothing to discourage its very close (1 m) proximity to them.

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